FIG. 1
(PRIOR ART)

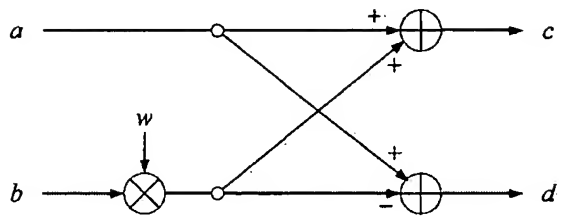


FIG. 2
(PRIOR ART)

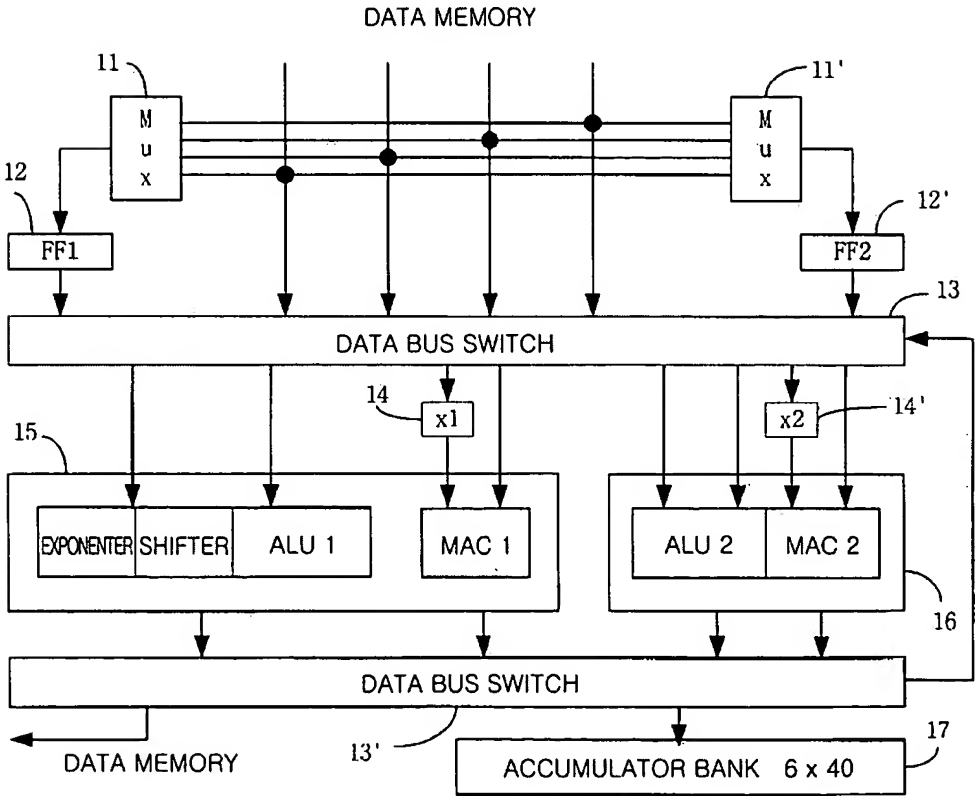


FIG. 3
(PRIOR ART)

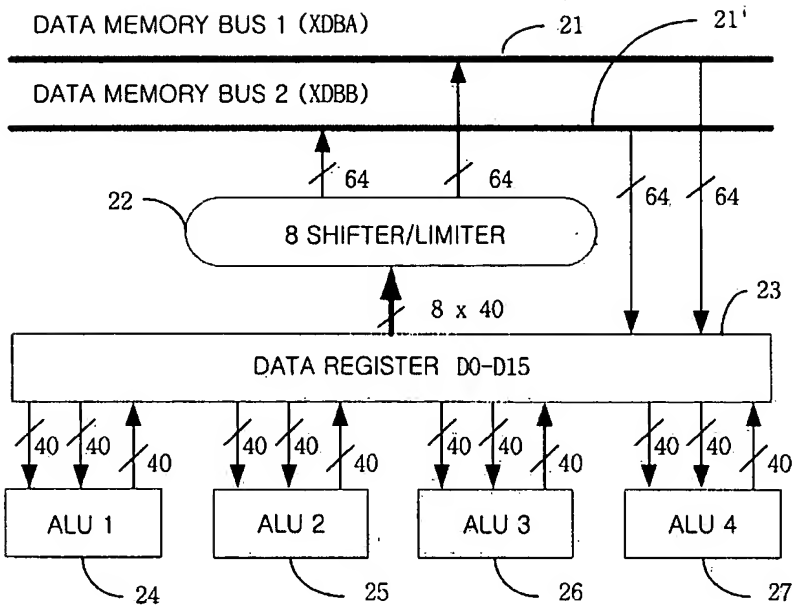


FIG. 4
(PRIOR ART)

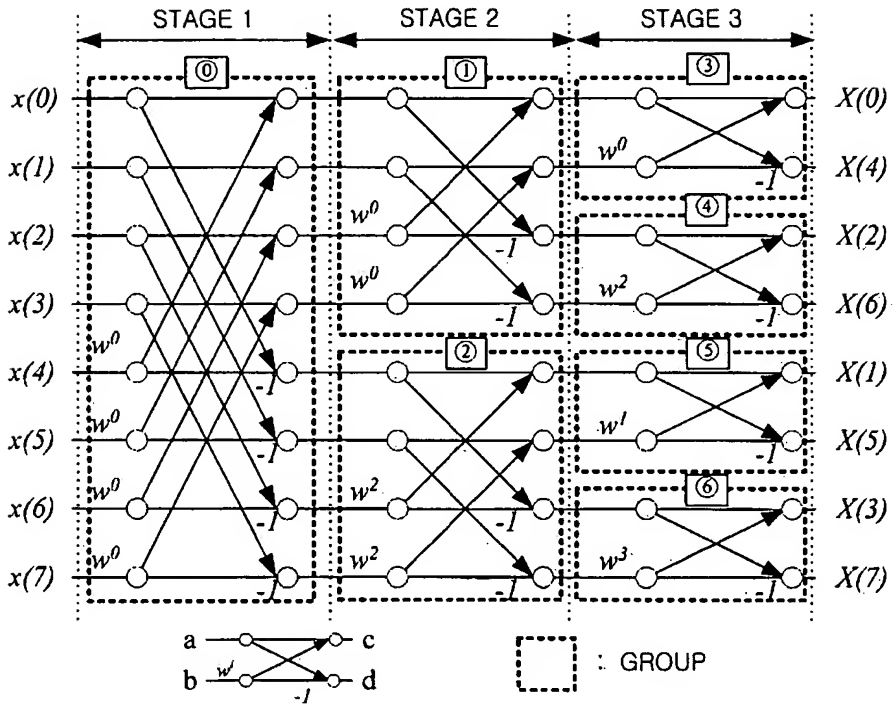


FIG. 5
(PRIOR ART)

```
do # THE NUMBER OF STAGES          STAGE REPEAT
    do # THE NUMBER OF GROUPS       GROUP REPEAT
        TWIDDLE FACTOR OF GROUP LOAD
        do # THE NUMBER OF BUTTERFLIES IN GROUP    BUTTERFLY REPEAT
            BUTTERFLY OPERATION
                    •
                    •
                    •
        end BUTTERFLY REPEAT
    end GROUP REPEAT
end STAGE REPEAT
```

FIG. 6

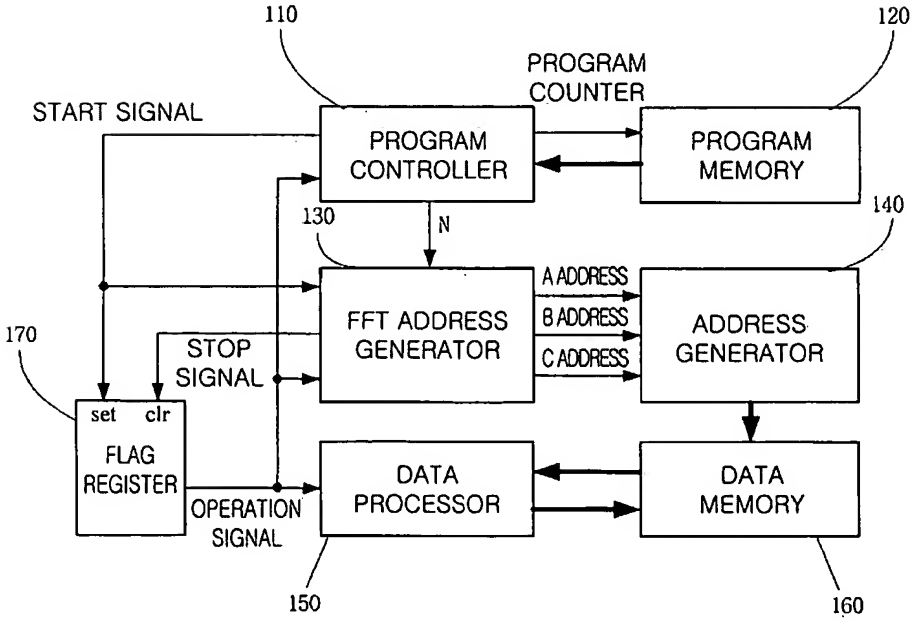


FIG. 7

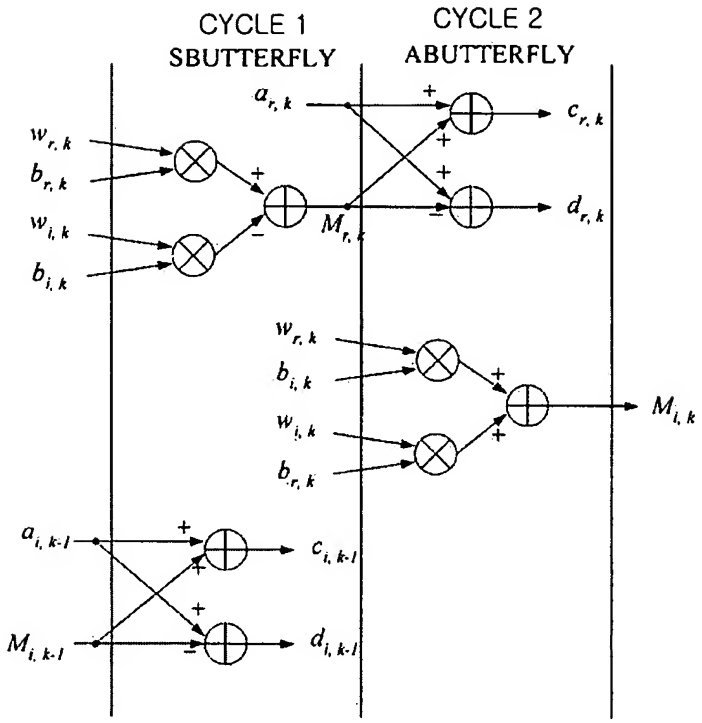

CYCLE 1
SBUTTERFLY
CYCLE 2
ABUTTERFLY
$a_{r,k}$
$w_{r,k}$
$b_{r,k}$
$w_{i,k}$
$b_{i,k}$
$M_{r,k}$
$c_{r,k}$
$d_{r,k}$
$w_{r,k}$
$b_{i,k}$
$w_{i,k}$
$b_{r,k}$
$M_{i,k}$
$a_{i,k-1}$
$M_{i,k-1}$
$c_{i,k-1}$
$d_{i,k-1}$

FIG. 8

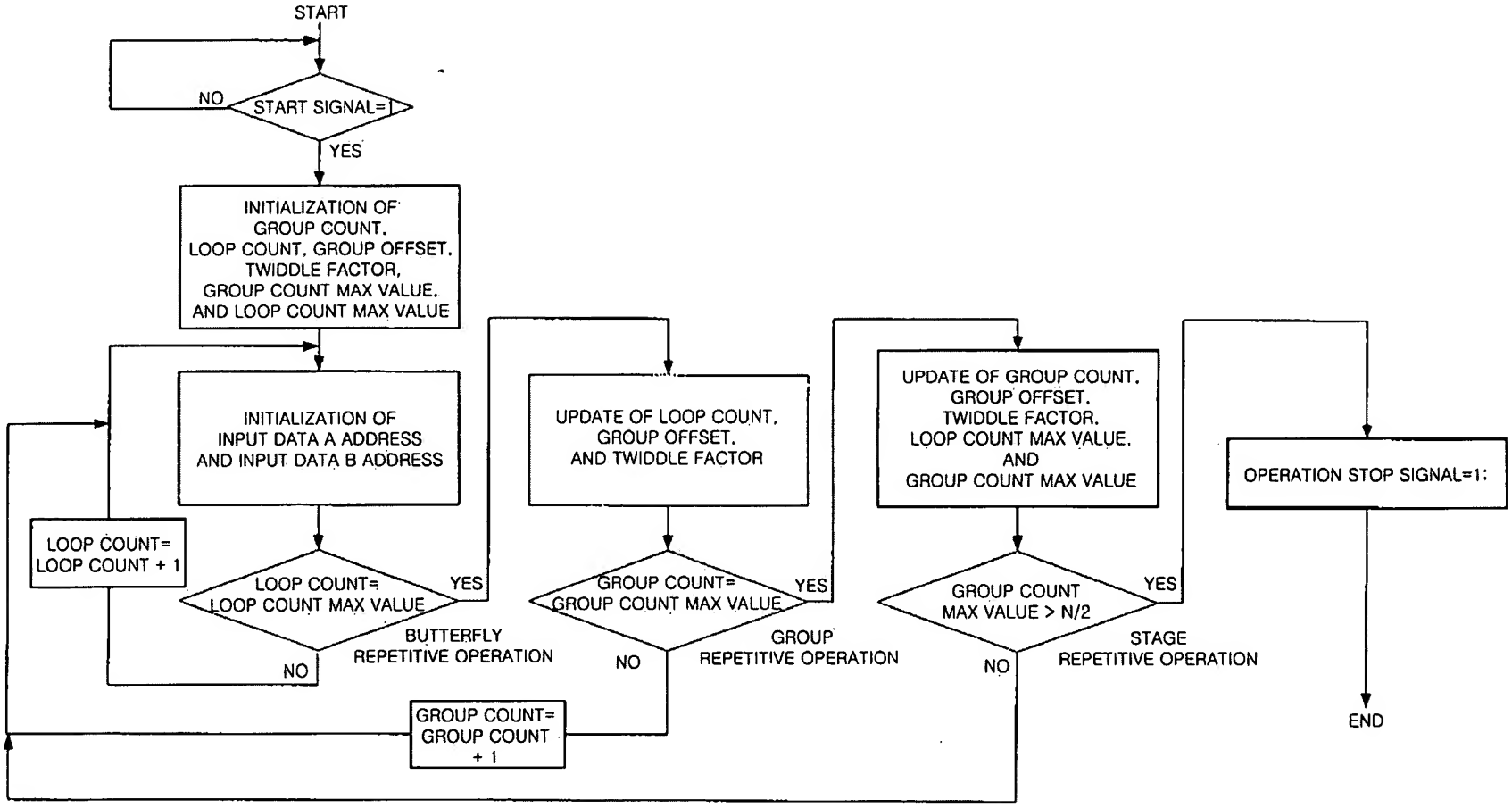

START
NO
START SIGNAL=1
YES
INITIALIZATION OF GROUP COUNT, LOOP COUNT, GROUP OFFSET, TWIDDLE FACTOR, GROUP COUNT MAX VALUE, AND LOOP COUNT MAX VALUE
INITIALIZATION OF INPUT DATA A ADDRESS AND INPUT DATA B ADDRESS
LOOP COUNT= LOOP COUNT + 1
LOOP COUNT= LOOP COUNT MAX VALUE
YES
NO
BUTTERFLY REPETITIVE OPERATION
UPDATE OF LOOP COUNT, GROUP OFFSET, AND TWIDDLE FACTOR
GROUP COUNT= GROUP COUNT MAX VALUE
YES
NO
GROUP REPETITIVE OPERATION
GROUP COUNT= GROUP COUNT + 1
UPDATE OF GROUP COUNT, GROUP OFFSET, TWIDDLE FACTOR, LOOP COUNT MAX VALUE, AND GROUP COUNT MAX VALUE
GROUP COUNT MAX VALUE > N/2
YES
NO
STAGE REPETITIVE OPERATION
OPERATION STOP SIGNAL=1;
END

FIG. 9

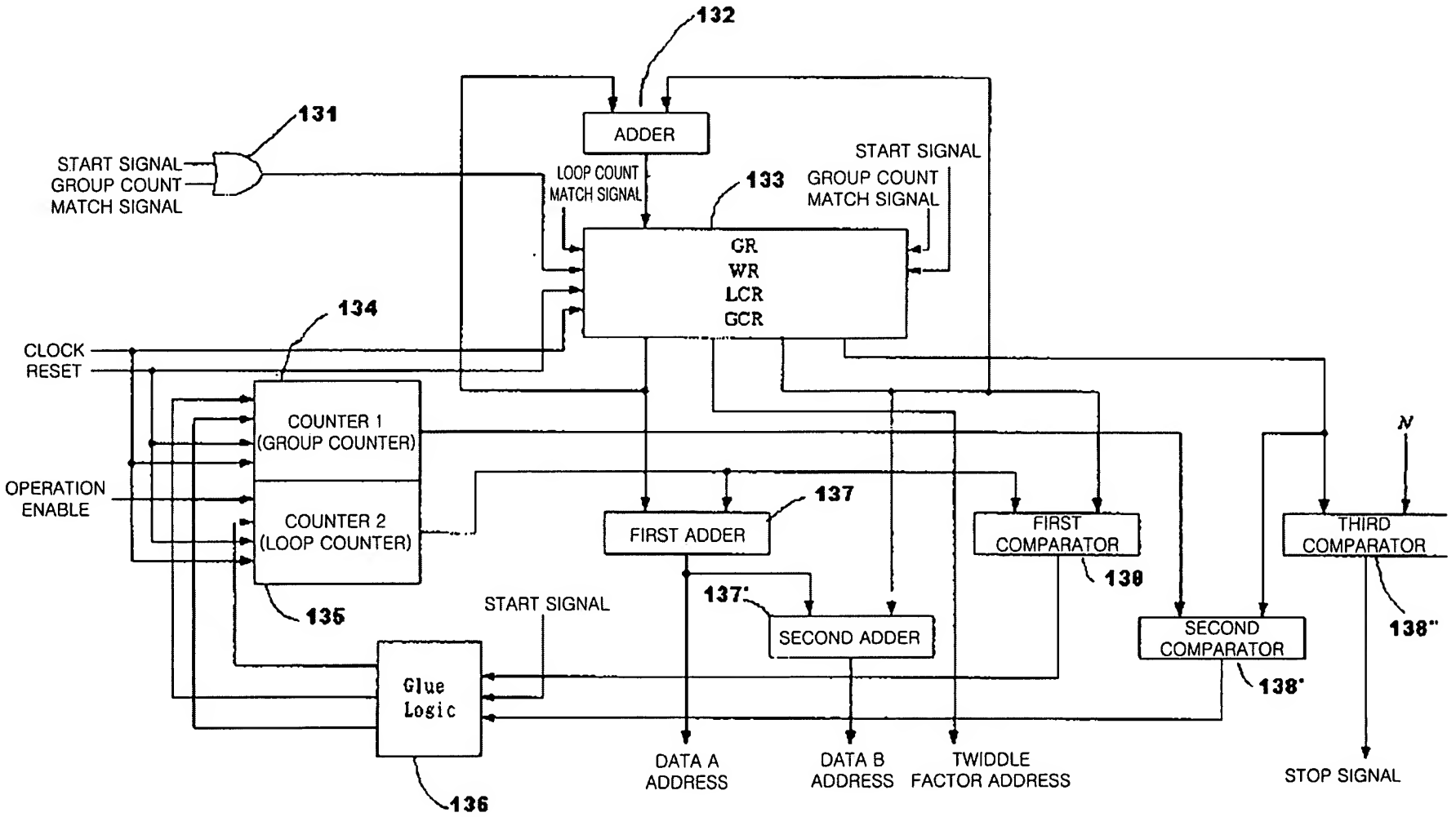

132
131
ADDER
START SIGNAL
GROUP COUNT
MATCH SIGNAL
START SIGNAL
LOOP COUNT
MATCH SIGNAL
133
START SIGNAL
GROUP COUNT
MATCH SIGNAL
GR
WR
LCR
GCR
134
CLOCK
RESET
COUNTER 1
(GROUP COUNTER)
OPERATION
ENABLE
COUNTER 2
(LOOP COUNTER)
135
137
FIRST ADDER
FIRST
COMPARATOR
130
THIRD
COMPARATOR
N
137'
START SIGNAL
SECOND ADDER
SECOND
COMPARATOR
138"
138'
Glue
Logic
136
DATA A
ADDRESS
DATA B
ADDRESS
TWIDDLE
FACTOR ADDRESS
STOP SIGNAL

FIG. 10

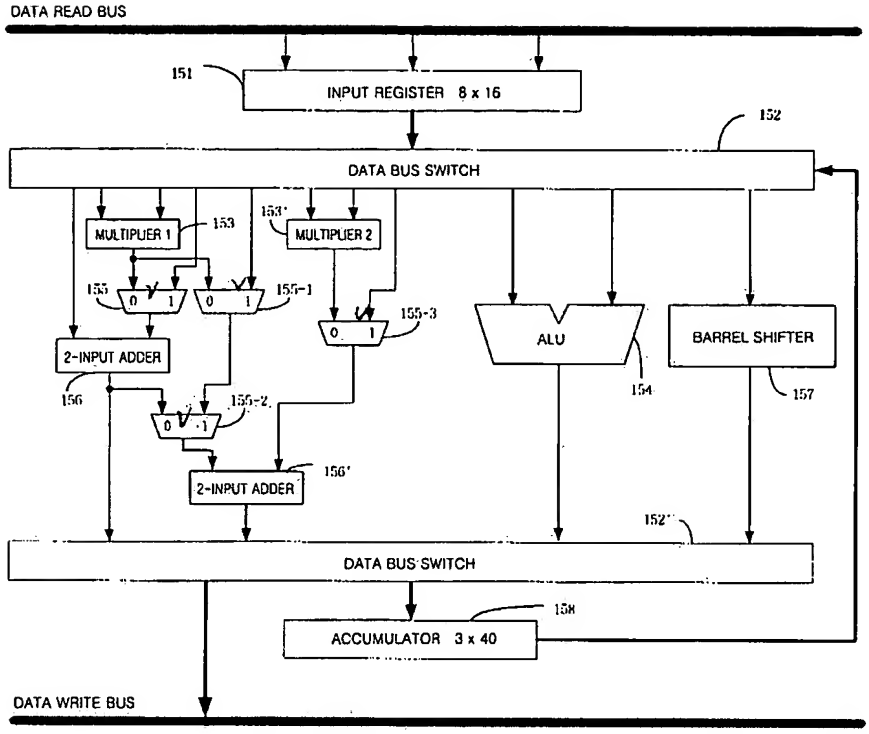

DATA READ BUS
151
INPUT REGISTER 8 x 16
152
DATA BUS SWITCH
MULTIPUER 1
153
153'
MULTIPUER 2
155
155-1
155-3
2-INPUT ADDER
156
155-2
156'
2-INPUT ADDER
ALU
154
BARREL SHIFTER
157
152'
DATA BUS SWITCH
158
ACCUMULATOR 3 x 40
DATA WRITE BUS

FIG. 11A
(PRIOR ART)

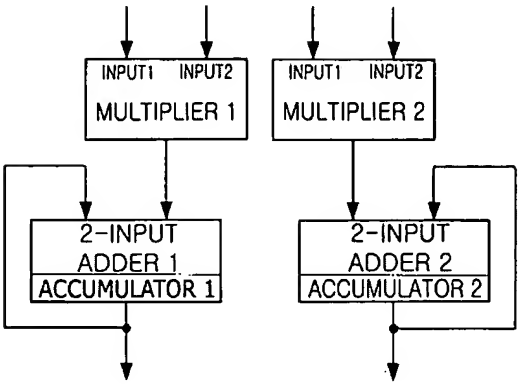


FIG. 11B

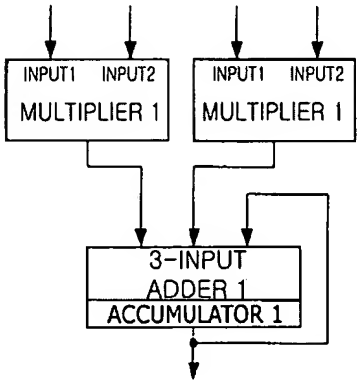
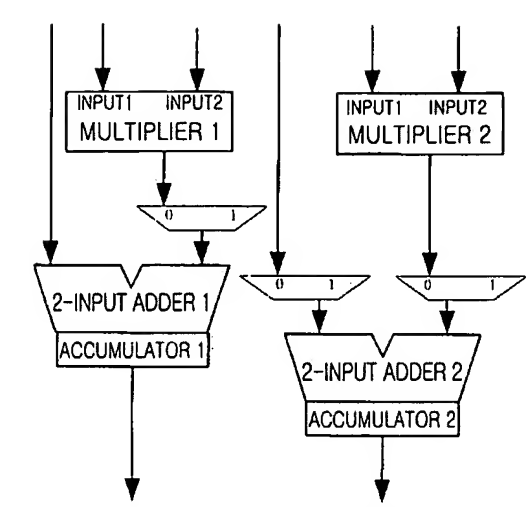
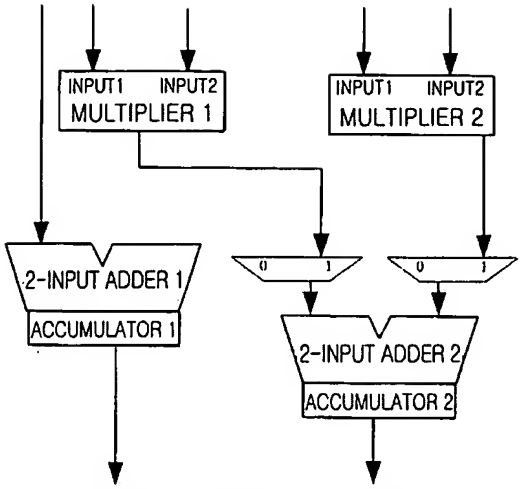


FIG. 11C

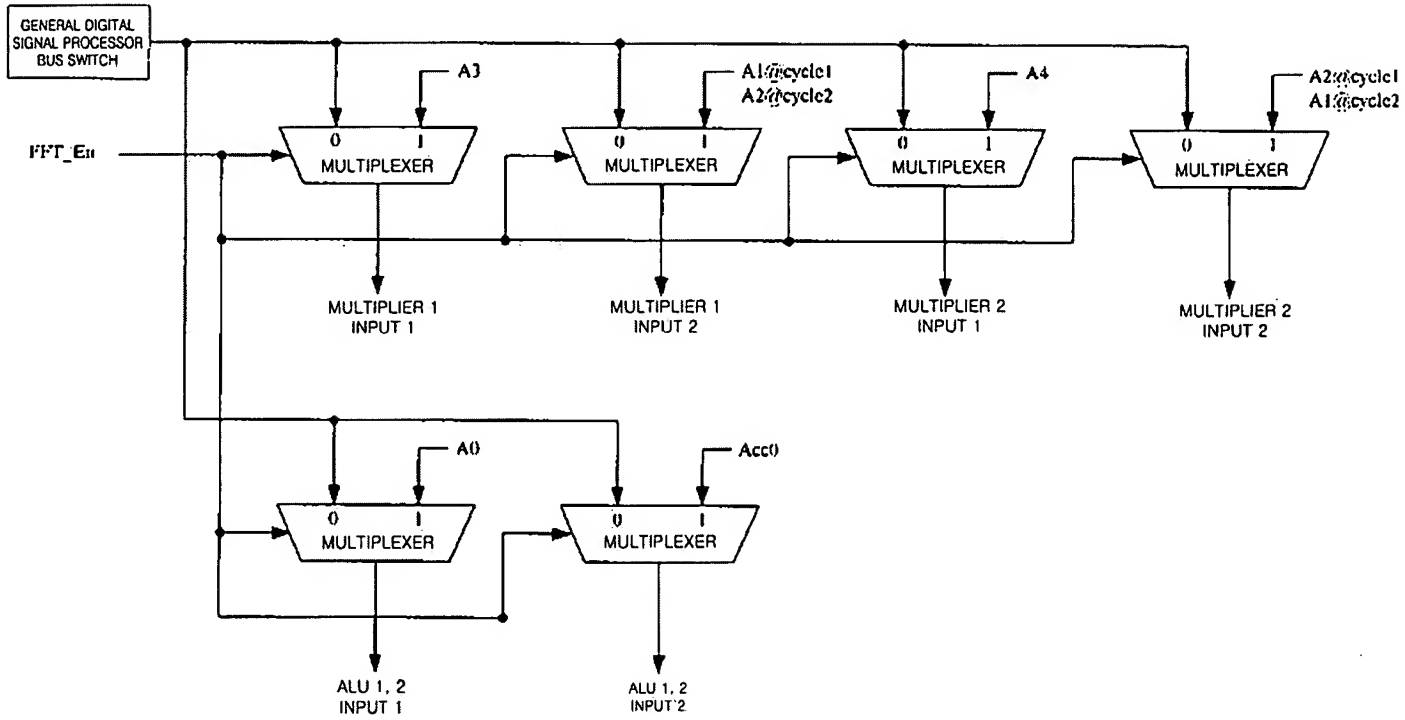


WHEN MULTIPLEXER SELECTION INPUT IS 0



WHEN MULTIPLEXER SELECTION INPUT IS 1

FIG. 12


GENERAL DIGITAL SIGNAL PROCESSOR BUS SWITCH
FFT_En
A3
A1@cycle1
A2@cycle2
A4
A2@cycle1
A1@cycle2
0
1
MULTIPLEXER
MULTIPLIER 1 INPUT 1
MULTIPLIER 1 INPUT 2
MULTIPLIER 2 INPUT 1
MULTIPLIER 2 INPUT 2
A0
Acc0
ALU 1, 2 INPUT 1
ALU 1, 2 INPUT 2